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Title

The Use of Motivational Interviewing to Enhance Smoking Cessation for the Underserved in a Free Clinic Setting

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Abstract

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BACKGROUND

San Bernardino County is the largest county in the United States with a population estimate of over 2 million people (1, 20). Over half (52.8%) of the population consists of those who identify as Hispanic or Latino, and 41.5% of people aged 5 years and older speak a language other than English at home. Also, fewer than 1 out of 4 (19.3%) of the population have a bachelor's degree or higher. People living in poverty make up of 17.6% of the population and those aged 65 years and under without health insurance are 9.1% of the county population (20). San Bernardino County is also a Medically Underserved Area (MUA), designated so in 1995 by the California Healthcare Workforce Policy Commission. Once areas are assigned as MUA, the status is permanent regardless of any changes in demographics (16).

In addition to the above demographic factors which characterize San Bernardino County, there is also heavy air pollution in the area. According to the State of the Air 2018 report, the county received an F grade for Ozone and 24-Hour Particle Pollution; the Annual Particle Pollution grading is incomplete because in order compare levels of pollution in San Bernardino County with national standards, the county needs to collect three years' worth of data. The State of the Air report is compiled by the American Lung Association (ALA) and uses public data from monitors run by the counties, states, federal agencies, and tribes in the United States. Grades for Ozone and 24-Hour Particle Pollution are calculated as follows: days when air pollution levels are above a set range are assigned certain weights, and the average of those values; grades A-F are then assigned according to those weighted averages. The ALA uses the yearly mean particle pollution levels calculated by the Environmental Protection Agency (EPA) to grade the Annual Particle Pollution category (11). Many people living in the county

experience a poor state of health because of such poor grades in air quality. Chronic diseases such as asthma is one relevant health issue which people suffer from in the area.

Asthma is a chronic lung disease which can be diagnosed at any time during the patient's life (13). One important study addressing asthma disparities within California reported an increase in negative asthma effects with an increase in annual average pollution concentrations (17). According to data from the State of the Air 2018 report, ozone pollution is deleterious to one's health and people with cardiovascular and lung diseases, such as asthma, are particularly susceptible to the harmful effects of ozone pollution. This statement is also supported by the EPA, which concludes ozone pollution can cause respiratory harm including exacerbated asthma. Particle pollution is another factor which harms health and can cause health issues such as lung cancer, heart disease, and asthma attacks. People especially at risk from particle pollution are those with lung disease, such as asthma, because particle pollution can cause decreased lung function and cause patients to increase their use of asthma medications (11). So patients who suffer from asthma or other respiratory diseases living in San Bernardino County are in an environment in which the quality of air worsens their health. Another separate but controllable factor with similar negative health consequences to air pollution is smoking.

Nicotine in tobacco is the major chemical which makes tobacco products addictive. In the 1988 Surgeon General report, *The Health Consequences of Smoking: Nicotine Addiction*, the report concluded "Nicotine is the drug in tobacco that causes addiction" (8). According to the American Lung Association, smoking tobacco kills over 480,000 people in the United States every year and is the leading preventable cause of death; also more than 41,000 people die from secondhand smoke each year (28). The top groups of people disproportionately troubled by tobacco use and cigarette smoking include uninsured Americans and adults who have not

graduated from high school. Increased education was associated with decreased smoking rates, as adults who did not graduate high school smoke at a rate of 26.1% compared to those who did graduate (14.9%). For the uninsured, adults under 65 years of age smoke at a higher rate (28.4%) than those with private health insurance (11.8%). The privately insured have more access to primary care, follow-up smoking assessments, and smoking cessation medication because of insurance coverage and as a result have a higher chance of quitting smoking (29). In San Bernardino County, 15% of adults identified as current tobacco smokers in 2009 (25). Those people who smoke tobacco bring in a deadly concoction of more than 7,000 chemicals into their bodies and increase their risk for severe health problems (26). When smoke is inhaled, the air passages in the body are irritated and make it more difficult to breathe; in serious cases, smoking can trigger asthma attacks (27).

Despite smoking being the top preventable cause of death in the United States, a lack of tobacco control in San Bernardino County is evident. The State of Tobacco Control 2018 report indicates San Bernardino county has an Overall Tobacco Control Grade of F. The Smokefree Outdoor Air category received a grade of D, Smokefree Housing received an F, and Reducing Sales of Tobacco Products also received a grade of F (2). The lack of tobacco control, lack of higher education, and lack of health insurance in the county may be factors in addition to the addictive properties which make it harder for smokers to quit. According to the Surgeon General 2013 report, any attempts to quit smoking cigarettes are recognized as a key intermediate step to increasing cessation rates. In the 2010 National Health Interview Survey, 68.9% of current adult daily smokers showed interest in quitting smoking and in 2012, 42.7% of daily smokers tried to stop smoking. There was also a relationship between smoking and education, with attempts to quit highest at the college level (49.0%). This supports the claim from the American Lung

Association that increased education reduces smoking rates (9). However, the number of people who attempt to stop smoking is lower than those who simply show interest. According to the Centers for Disease Control and Prevention (CDC) regarding Smoking and Tobacco Use, in order to quit smoking it may take several attempts because many who do temporarily quit end up smoking again due to withdrawal symptoms. The CDC also states treatments with more “person-to-person contact” are ones proven to be effective to help smokers quit (26). A similar form of treatment to personal contact which could help smokers quit is Motivational Interviewing.

MOTIVATIONAL INTERVIEWING

Motivational Interviewing (MI) is a patient-centered counseling method intended to enhance patients’ intrinsic motivation so they can acknowledge their health issues, change adverse health behaviors, and adopt healthier lifestyles. It was developed by William R. Miller and Stephen Rollnick and is considered an effective intervention strategy in treating lifestyle diseases (24). One study found MI to be significantly effective and generally equivalent to other treatment methods in reducing risky behaviors and improving patient engagement in the interview. It also concluded MI is applicable to patients regardless of their age, gender, or health issue and may be more effective for ethnic minority patients (14). By guiding the interaction with patients to activate their motivation for change, MI encourages them to create their own solutions to situations which prevent them from changing unfavorable health behaviors (7). A unique aspect of MI is that the patients, not the practitioners of MI, are in charge of making decisions on when they want to change and how they plan to escape their unhealthy behaviors (21).

In MI, it is crucial that the person implementing MI understands each patient has a unique lifestyle, values, perspective, and feelings. Also, every patient possess the ability for potential change but they may simply be lacking in intrinsic motivation. The responsibility of the person conducting MI is to elicit and enhance patients' motivation so that they may change their behaviors in the direction they want (6). It is important to enhance motivation, because methods which accomplish this are tied with positive treatment outcomes and more patient participation (5). A way to accomplish this responsibility is to practice MI by following the five general principles of MI (6):

1. Empathize via reflective listening
2. Identify discrepancies between goals and current behaviors of patients
3. Avoid arguments and direct confrontation
4. Roll with patients' resistance
5. Enhance patients' self-efficacy

The follow paragraphs elaborate on the general principles.

When implementing MI with empathy, one should not direct the patients, but listen to them. This indicates to patients that the person conducting the interview respects them and recognizes their struggles (6). It also creates an environment where patients can be more open in discussing their health problems and concerns because reflective listening helps clarify any ambivalence patients may have (4). In turn, this will facilitate a feeling of connectedness between the patient and interviewer. Whereas traditional approaches may have seemed authoritarian to patients, MI expresses empathy and reflects back to patients what was discussed to help them clarify their issues and intent to change. Another research supporting the use of empathy shows positive treatment results associated with empathy exhibited through reflective

listening (5). However, empathizing with the patients in MI does not mean identifying with them or sharing similar experiences as this may disrupt the interviewer's ability to properly conduct MI (6).

In addition to listening to patients' concerns, it is necessary to help patients understand how their current behaviors contradict or differ from those they desire to achieve. The discrepancy between the two can be touched upon by first letting patients be aware of the detrimental consequences of their problematic behaviors (6). This will allow them to acknowledge the source of such actions and then understand how it compromises their desired goals. To make this easier for patients to accomplish, the MI practitioner should balance empathy with enough discrepancy to motivate change (21). Again, reflective listening enables the person conducting MI to help patients emphasize their end goal and recognize the discrepancy between their behaviors. Highlighting this disparity can further enable patients to be one step closer to committing to change (6).

Some issues which may arise when attempting to help patients recognize they need to change their current behavior are resistance and argument. Patients unwilling to acknowledge a problem exists at all may particularly be more resistant to following MI and start to argue against it. To the interviewer, a sign of resistance means a different direction must be taken or more reflective listening is required. It is crucial to remember the patient is the one who makes progress in MI possible and that the interviewer simply "walks" along with the patient through MI (6). It is important to "roll with resistance" because it is a way to soften resistance (21). Avoiding arguments and rolling with resistance are similar in that both show the patient the interviewer is carefully listening and encouraging the patient to stay involved in the interaction. Common behaviors exemplifying resistance include denying, ignoring, interrupting, and arguing

against MI. Some approaches to respond to patients' resistance include shifting focus away from the challenges and instead towards the goals, amplified reflection, reframing, and agreeing with the patient but adding a twist to continue the discussion (6).

Enhancing patients' belief in their ability to succeed or accomplish a task is crucial to helping them be ready to change. The individual implementing MI needs to accept patients' previous attempts of changing behaviors or current interests in changing, and let patients understand any attempts or interests is progress (6). Also, focusing on the strengths and competencies of the patient can further increase self-efficacy (5). Support and acknowledgement from the interviewer tells patients that they have the ability to change and reach their desired goal. This will improve the self-efficacy of patients and allow them to voice their intentions. Another factor which makes it easier for the patient to draw out their concerns is to ask open-ended questions which promote communication. Not only will the patient be allowed to talk more, but also the interviewer can receive more information and better understand the patient (6). Enhancing patients' self-efficacy in addition to the other four principles which define MI have been used in various health settings and for different health issues.

As a scientifically tested technique intended to enhance patients' motivation for change, MI has been found to be effective in helping patients manage health conditions such as diabetes and obesity, asthma medication adherence, alcohol abuse, smoking cessation, and chronic obstructive pulmonary disease. In a study using MI as an intervention method to help patients deal with adult obesity and diabetes, four sessions of MI resulted in significant improvements in self-efficacy and body mass index. MI was also determined to be effective in enhancing self-efficacy, self-management, and quality of life for patients with Type 2 Diabetes who received MI (7). A different self-management intervention study using MI concepts concluded MI is a way to

guide patients to change their behaviors and is practical in managing patients diagnosed with chronic obstructive pulmonary disease. It further concluded MI is an evidence-supported, patient-centered method which evokes and strengthens one's motivation for change (3).

One study focusing on using MI to promote medication adherence for African American adolescents diagnosed with asthma found the method to be feasible and a promising approach to enhance medication adherence (22). Another aimed to study the perceptions of healthcare professions (HCP) trained in MI and also promoting asthma treatment adherence. The study surveyed 360 HCPs and half received a form of training intervention; specifically 90 of those trained HCPs received MI. The conclusion of this study was similar to that of the previous study (23). In an important meta-analysis which assessed 72 randomized controlled MI trials (including 12 smoking cessation-related), the effects of MI were seen in 67% of those studies. Another study supports a similar conclusion in that MI is a feasible smoking cessation intervention for female smokers diagnosed with HIV (15). In addition to the scientific literature which supports the effectiveness of MI, there are other benefits.

Advantages of MI include: low cost, compatibility with healthcare delivery, and an emphasis on patient autonomy (6). Patient autonomy is especially important because patients have the right to make their own medical decisions, and MI emphasizes patients' motivation leading them to take care of their health. It can also be demonstrated by both indirect and direct measures; indirect measures include questionnaires and direct measures include blood pressure or weight. Additionally, effects of MI can be seen in brief interactions of only 15 minutes, but impact can increase with more encounters (24). Another benefit of MI is that it can be implemented in any stage of behavior change. The Stages of Change Model has five stages and this is represented as a wheel in which patients move back and forth between the different stages.

The five stages of the cycle are: Precontemplation, Contemplation, Preparation, Action, and Maintenance (5). Individuals usually start in the Precontemplation stage because many who smoke do not consider their behavior a problem to their health. Those who do understand a problem exists and are interested in receiving support to change behaviors continue to the Contemplation stage. Once the individuals strengthen their commitment to change behaviors and plan goals to accomplish, they are in the Preparation stage; just because they are in this stage does not mean they have stopped smoking. The Action stage consists of patients who are carrying out their plan for change, and this stage can last for 3-6 months after quitting smoking. In the Maintenance stage, individuals are working to sustain their condition and prevent relapse. This stage can last anywhere from 6 months to several years (5).

Some patients can move through various stages more quickly than others, and remain in specific stages for a longer time. Some even go through the behavior change cycle numerous times before maintaining change. Relapse is also possible into previous stages or a complete return to smoking after a period of abstinence. Individuals practicing MI need to clarify to patients that relapse is not considered a failure nor an absolute barrier to changing behaviors. Also, reverting to smoking does not mean the patient has given up committing to achieving smoking cessation (5). In addition to the fact that MI can be implemented at any of the aforementioned stages, MI is a form of patient-focused care which has shown to increase not only patient satisfaction, but also physician performance; the physician can also see more patient retention via patient-focused care methods (12). In addition to the capability to change, motivation is also present in every person. To activate that internal motivation and work with patients to facilitate change, MI is a method which can be used to help patients in San

Bernardino County diagnosed with asthma to achieve smoking cessation. It can specifically be applied to patients of the San Bernardino Free Clinic.

SAN BERNARDINO FREE CLINIC

In San Bernardino County, 17.6% of the population live in poverty and 9.1% lack health insurance (20). Such people living in poverty and lacking health insurance in the county have limited access to primary healthcare services. San Bernardino Free Clinic (SBFC) is a student-run free clinic which provides free basic healthcare to the underserved in the area. The clinic is run by a team of University of California, Riverside (UCR) School of Medicine medical students and undergraduate students. It is in this setting where MI can be applied by UCR medical students to help patients change adverse health behaviors. Additionally, a majority of SBFC patients come from low-income, Spanish-speaking populations who lack health insurance and are unable to receive medical care elsewhere. The framework for applying MI at the clinic will take this specific patient population into consideration.

FRAMEWORK

MI is efficacious across various health settings and for a variety of health behaviors, but we have not been able to identify its use in student-run free health clinics (4). The following framework will discuss how to utilize MI at SBFC and analyze the effects of medical students conducting MI in motivating patients diagnosed with asthma to change their smoking behaviors. It is expected that MI applied at SBFC will motivate patients to recognize their health issues, change detrimental behaviors, and adopt healthier lifestyles.

I. Participants

The participants in this planned study will include UCR medical students and SBFC uninsured patients.

- A) The medical students who are eligible to participate in the study are those who completed the 2-day MI training. A sample of 10 medical students will be obtained.
- B) SBFC uninsured patients will be eligible if they have been smoking tobacco or cigarettes for at least 3 months, have asthma or other respiratory diseases, and have not received any smoking cessation programs prior to MI. The use of smoking cessation products such as nicotine patches and prescription drugs alongside others are included in the definition of smoking cessation programs. Patients who have received a smoking cessation program in the past cannot participate in this study. All patients must be at least 18 years or older and a sample of about 50 patients will be obtained.

II. MI Training

Medical students who receive MI training will be trained by Dr. Barbara Ackerman, a clinical psychologist at the Riverside University Health System. Training lasts two days and the first training session will include lectures on MI foundations and proper interviewing techniques. The second training session will consist of applying the learned techniques and skills with standardized patients. Encounters with the standardized patients will last 30 minutes and evaluators will be present to provide medical students feedback on their interaction. The actual

training dates will be determined by UCR SOM and the standardized patients will also be recruited by the school.

A study which evaluated a MI curriculum for third year medical students found students who participated in the curriculum saw a sustained increase in ability to guide patients for behavior change in a standardized patient case. A total of 80 medical students participated in the MI curriculum which lasted two hours, and this group was compared to a group of 19 students who did not participate in the curriculum. The study concluded medical students can be trained in MI to enhance patients' intrinsic motivation for behavioral change (10).

Some topics covered in the first training session:

The five general principles of MI are rolling with resistance, expressing empathy, avoiding arguments, developing discrepancy, and supporting self-management. Another topic includes MI strategies, which are asking open-ended questions, affirming the patient, reflecting on what the patient expressed, and summarizing the behavior plan created by the patient. Open-ended questions facilitate a conversation and let the patient take charge in their actions. Affirming the patient and any prior attempts to change behaviors is important to show even small changes in behaviors is a positive sign of progress. Also, reflecting and summarizing back to the patient regarding what was discussed and planned shows patients that the person conducting the interview is paying attention. Adhering to the MI principles, utilizing the MI strategies, and listening to patients' readiness to change are the three basic tasks of the MI interviewer. The session will also discuss how to identify patients' readiness to change and what to do if the patient does not feel ready to change.

A sample MI rating scale for evaluating medical students in the second training session:

Medical students' behavior during the entire interview with a standardized patient will be evaluated on a 1-5 rating scale. 1 represents "no use during the interview" and a 5 represents "best possible use during the interview." The behaviors evaluated will be the 4 MI Strategies: open-ended questions, affirmations, reflections, and summaries (19).

Open-ended Questions: Open-ended questions are those that allow a wide range of possible answers. The questions may seek information, invite the client's perspective, or encourage self exploration.

NO USE DURING THE INTERVIEW **BEST POSSIBLE USE DURING THE INTERVIEW**

1 2 3 4 5

Affirmations: Affirmations include something positive or complimentary to the client. They may be in the form of appreciation, confidence, or reinforcement. They comment on the client's strengths or efforts.

NO USE DURING THE INTERVIEW **BEST POSSIBLE USE DURING THE INTERVIEW**

1 2 3 4 5

Reflections: Reflections are statements made in response to a client's statements. They capture and return to the client something that the client has said.-Reflections can simply repeat or rephrase what the client has said or may introduce new meaning or material.

NO USE DURING THE INTERVIEW **BEST POSSIBLE USE DURING THE INTERVIEW**

1 2 3 4 5

Summary Statements: Summary statements are statements that distill what the client has said. They usually begin with a statement indicating a summary is being given (for example, "Here's what I've heard so far...."), then give a short summary, then end with an invitation for feedback (for example, "Is that what you've said?").

NO USE DURING THE INTERVIEW **BEST POSSIBLE USE DURING THE INTERVIEW**

1 2 3 4 5

III. Surveys

The surveys will assess the effects of MI on patient satisfaction, patient trust, and patient willingness to change smoking behaviors. The Motivational Interviewing Trainer Assessment (MITA) and a study which assesses a MI curriculum for third year medical students will be used to create the patient and medical student satisfaction surveys (18, 10). The MITA is a form of assessment which rates the application of MI techniques on a global 1-5 rating scale (18). In order to analyze the effects of MI, the patient group will complete both pre- and post-intervention surveys. Medical students will only complete a post-intervention survey. These surveys should take about 15 minutes to complete. Additionally, IRB approval for the surveys will be obtained.

A) Patient Surveys

The pre-intervention survey for patients will ask their willingness to quit smoking before the encounter with a medical student, whereas the post-intervention survey will ask patients about their willingness to quit smoking after the interaction. The post-intervention survey will also ask about their satisfaction and trust in the medical student's performance. Patient surveys will be printed in both English and Spanish because a majority of SBFC patients come from Spanish-speaking populations.

B) Medical Student Surveys

The survey for medical students will ask them about their interaction with the patient and how willing the patient seemed to change smoking behaviors at the end of the encounter. The survey will also ask the medical students how effectively they believe MI skills were applied in the interview based on the patient's level of participation in the

encounter. Medical student surveys will be printed in English and an electronic version of the survey may be provided.

IV. Incentives

Patients who complete the pre- and post-intervention surveys will be able to receive incentives in the form of \$15 Visa Prepaid Cards.

V. Analysis

Analysis will be done following data collection. Based on the actual method and type of data collected, the specific techniques will be selected to best analyze the data. If the data is collected using a similar form of the surveys in the Appendix, quantitative data analysis can be done.

DISCUSSION

The expected outcome of using this framework in a student-run free clinic is that medical student-conducted MI will motivate patients to be more willing to reduce their smoking behavior. Additionally, MI will lead to increased patient satisfaction and trust in their healthcare provider. Another application of MI is that it can serve as a low-cost alternative technique for both patients and free clinics as it may reduce the need for purchasing smoking cessation products.

Some limitations of this framework is that the medical student participant group does not include a control because it is difficult to measure if the medical students not trained in MI will

not use any form of the technique or partially use MI techniques in the patient interaction. Another is that the willingness to change behaviors via MI is only measured after one interview; it does not measure the effects of MI after multiple MI sessions. Follow-up sessions may be difficult to achieve at SBFC because of the nature of the clinic and patients who are wary of sharing personal information aside from completing necessary paperwork. Without access to patient contact information, it is difficult to contact them for possible phone follow-up sessions. Additionally, it is difficult to schedule follow-up appointments for patients with the same medical student who conducted MI in order to assess the progress of patients achieving smoking cessation. However, because effects of MI can still be seen in brief encounters lasting 15 minutes, MI at SBFC lasting about 30 minutes is expected to be significant enough to elicit motivational change in behaviors (24).

CONCLUSION

This framework can be used at SBFC to implement MI and measure the effects of MI in increasing patient satisfaction, trust, and willingness to reduce smoking behaviors. In order to administer the surveys and collect data, an IRB will be obtained. If MI is proven to be effective at SBFC, the method can be used to address other health diseases or potentially be used at other free clinics for the same or different issues.

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APPENDIX

Sample Patient Survey Questions:

Instructions: Fill in the scale to assess your healthcare provider’s interaction with you (healthcare provide is a medical student.) This survey is a used for research purposes only and your privacy is guaranteed. This is a completely anonymous survey and none of your information will be shared with any outside parties.

	Not applicable	Poor 1	2	3	4	5	6	Excellent 7
The medical student connected with you as a person.								
The medical student was empathic with you.								
The medical student was informative to you.								
The medical student invited you to share your understanding, perspective, and feelings.								
The medical student is sensitive to potential communication problems, acknowledges them and facilitate repair by asking open-ended questions.								
The medical student invited you to participate in decision-making.								
The physician shares control and power with you.								
The physician advised you on behavior change to reduce smoking.								
This was a collaborative relationship with two-way conversation.								
This interaction included discussion of prevention and health promotion.								

Sample Medical Student Survey Questions:

Instructions: Fill in the scale to assess your patient interaction with you. This survey is used for research purposes only and your privacy is guaranteed. This is a completely anonymous survey and none of your information will be shared with any outside parties.

Did you receive a Motivational Interviewing training?	Yes	No							
	Not applicable	Poor	1	2	3	4	5	6	7
Excellent									
The patient was able to take initiative and introduce his/her agenda.									
The patient asked the doctor questions.									
The patient was an active participant in a discussion about treatment options.									
The patient understood what she/he was supposed to do or was able to get clarification.									
The patient expresses their desire for change in their own words.									
The patient is confident in taking action and noticing that even small, incremental changes are important.									
The patient expresses their commitment to change their behavior in their own words.									
This was a collaborative relationship with two-way conversation.									
This interaction included discussion of prevention and health promotion.									